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## The Schooling Incentives Project Evaluation

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## The Schooling Incentives Project Evaluation

### Abstract

This report describes the first randomized evaluation of an education initiative aimed at children vulnerable to child labor. The promotion of education had been at the core of anti-child labor efforts for over a decade. Based on a survey of children aged 10-16 whose guardians worked in export-oriented carpet-weaving establishments in the Kathmandu Valley of Nepal, the authors found that a scholarship for education fees and expenses did not have a detectable impact on attendance. Adding economic support conditioned on school attendance to the scholarship significantly increased school attendance, improved test performance, and discouraged weaving among girls. That combination of scholarship and support reduced the prevalence of children living without a parent present.

### Keywords

education, child labor, carpet industry, Nepal, prevention

### Comments

#### Suggested Citation

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# **The Schooling Incentives Project Evaluation**

## **Research Project on Children Working in the Carpet Industry in India, Nepal and Pakistan**

**January 2012 | Final Report**

**Submitted to:**

United States Department of Labor  
Office of Child Labor, Forced Labor,  
and Human Trafficking  
Frances Perkins Building  
200 Constitution Avenue NW  
Washington, DC 20210



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The contents of this document did not necessarily reflect the views or policies of the U.S. Department of Labor, ICF International, The Nepal Goodweave Foundation, or New ERA, nor does any mention of trade names, commercial products, or organizations imply endorsement by the United States Government, ICF International, ICARE, The Nepal Goodweave Foundation, or New ERA.

## ABSTRACT

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This report describes the first randomized evaluation of an education initiative aimed at children vulnerable to child labor. The promotion of education had been at the core of anti-child labor efforts for over a decade. Based on a survey of children aged 10-16 whose guardians worked in export-oriented carpet-weaving establishments in the Kathmandu Valley of Nepal, the authors found that a scholarship for education fees and expenses did not have a detectable impact on attendance. Adding economic support conditioned on school attendance to the scholarship significantly increased school attendance, improved test performance, and discouraged weaving among girls. That combination of scholarship and support reduced the prevalence of children living without a parent present.

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## EVALUATING THE IMPACT OF EDUCATION SUPPORT

Self-selection into education support programs and the tendency of NGOs to engage first those most naturally motivated to education made carrying out rigorous impact studies of education initiatives difficult. The ideal way to estimate impact was to use randomization to assign children to a treatment group that received education support and to a control group that did not. In this case, GoodWeave Nepal identified 660 children vulnerable to child labor in 101 export-oriented carpet-weaving establishments in the Kathmandu valley of Nepal. 220 of these children were randomly selected to receive a scholarship of NPR 3,950 (55 USD) for one year for school-related costs such as fees, tuition, uniforms, and books. 220 were selected randomly to receive that scholarship plus an additional stipend of NPR 1,000 (14 USD) per month per child if the child attended school at least 80 percent of school days in the previous month. The remaining 220 children acted as a control group. Information on schooling and work was collected on all 660 children before random assignment occurred, 5 months into the school year, and within a month after the end of the school year.

## RESULTS

Any impact of the scholarship on attendance in the year of support was too small to be detected. For boys, three-fourths of the scholarship substituted for education spending that would have otherwise occurred. For girls, it resulted in more spending on their education; nine-tenths of the scholarship amount for girls was new spending. After the year of support, the female scholarship recipients were more likely to work in pre-weaving activities (carding, washing, and spinning wool) compared to other groups. The evidence was inconclusive whether the increase in pre-weaving was accompanied by a decline in other work activities such as weaving.

The scholarship and stipend combination treatment increased school attendance and reduced work compared to the control group that did not receive support. Girls especially benefited. Female school attendance rates increased by 13 percent, and beneficiaries were 75 percent less likely to miss a month of school compared to the control. Treated girls were 62 percent less likely to fail their current grade than girls in the control group and were 68 percent less likely to work in weaving in the month after financial support ended. Also, treated girls were 63 percent less likely to live without a parent after the year of support compared to control girls.

## **POLICY IMPLICATIONS**

The authors cautioned that the results said little about the impact of long-term education support and did not necessarily generalize to other contexts. In the short term, in this context, school cost subsidies did not promote schooling or reduce child labor on average. Conditional economic assistance appeared to have had an impact, especially for girls. The fact that the impact of the stipend extended beyond the period of support highlighted the importance of poverty motives for child disengagement from school and entry into weaving.

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## FOREWORD

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This is the final report of the Schooling Incentives Project Evaluation (SIPE) Study, which was one component of the "Research on Children Working in the Carpet Industry of India, Nepal, and Pakistan" (Carpet Project) that was funded by a Cooperative Agreement between the Bureau of International Labor Affairs, U.S. Department of Labor (ILAB-USDOL), and ICF International, Inc. (ICF). The Carpet Project's overall objective was to develop reliable, accurate, and valid data and information about the prevalence, working conditions, and demand for children's work and child labor in the handmade-carpet export industry in India, Nepal, and Pakistan. ILAB also asked ICF to identify good practices to eliminate child labor in the carpet industry and to develop creative and innovative research methodologies, including field-testing methodologies to evaluate the impact of interventions that were designed to eliminate child labor in the industry.

To accomplish its purpose, the project designed and conducted four major quantitative research studies and a series of semi-structured qualitative research activities to orient the quantitative studies. Two of the quantitative studies and almost all of the qualitative activities were conducted in all three countries. The other two quantitative studies occurred only in Nepal.

The project defined the production process to include the processing of wool (supply chain) to produce dyed wool thread for carpets; the primary production of carpets by weaving/hand-knotting, hand-loomed, and tufting; and the post-production finishing of carpets until they were export-ready. The production process occurred in two types of establishments: the carpet factory (CF) and the carpet household (CHH). The two types were distinguished by the nature of the relationship between the labor force and management. The factory employed primarily hired labor, while the household used primarily family labor.

This document is the final report of the Schooling Incentives Project Evaluation (SIPE) Study in Nepal. The objectives of that study were to pilot the use of randomized control treatment (RCT) trials to evaluate the causal impact of interventions that were supported by the U. S. Department of Labor and to identify good practices to eliminate child labor in the carpet industry. The SIPE Study was an RCT impact assessment that examined the impact of two educational interventions, paying school costs (scholarships) and providing economic support (stipends) to families, on children's attendance and success in school. Both of the selected interventions had been used extensively in anti-child labor programs that were funded by the U.S. Department of Labor.

The Prevalence and Conditions (PC) Study was a large-scale quantitative study conducted in all three countries. Its primary purpose was to increase the knowledge base on the prevalence and nature of children's work and child labor in the carpet industry in the three countries. The study succeeded in producing reliable, statistically sound, nationally representative estimates of the prevalence of working children and child labor and detailed descriptions of children's working



conditions in the production process of the carpet industry. The PC Study's estimates of the prevalence of child labor and the working conditions of children were based on a stratified random sample survey of the factory-based and household-based industry in all three countries.

The Sending Areas (SA) Study in Nepal complemented the Prevalence and Conditions (PC) Study to further our understanding of the existence and conditions of child trafficking and bonded labor, focusing on the migration of children from rural areas in Nepal to work in the carpet factories (CFs) in the Kathmandu (KTM) Valley. The "sending areas" for this study were the districts in Nepal (and specific wards and communities within those districts) from which many children emigrated to work in the carpet factories in KTM. The first objective of the SA Study was to identify and better understand the characteristics and motivation of (a) children who migrated to work in the CFs and (b) the families that sent their children to work in the CFs in KTM. The second objective was to identify and analyze migration patterns and increase our understanding of the existence and characteristics of child trafficking and bonded labor. The SA Study focused on Nepal because the PC Study revealed that Nepal had the highest rate of child trafficking among the three countries.

The Labor Demand (LD) or Establishment Panel Study was another major quantitative study that was conducted in all three countries. Its primary purpose was to produce reliable, statistically sound, nationally representative estimates of variation over time in the employment of labor, particularly children's labor, in the handmade carpet export industry in the three countries. The objective was to understand the underlying causes of variation in children's employment in the carpet industry.

In addition to the four quantitative studies, the project also conducted the Best Practices (BP) Review, a qualitative meta-analysis of documented "best practices" for preventing, reducing, or eliminating child labor, especially the worst forms of child labor, in the carpet industry. The primary purpose of the BP Review was to identify and evaluate the most effective programs and interventions that were currently and previously employed to target child labor in the industry. The Review utilized a literature review, consultation with key stakeholders and experts, and a field study that included interviewing program staff and clients (beneficiaries) in India and Nepal.

The project started in October 2007 and was scheduled to terminate at the end of May 2012. The methodology, data, and findings of the project's studies were documented in eight final reports. Three country reports for India, Nepal, and Pakistan were primarily based on the PC Study. There were separate reports for the SIPE Study, the LD Study, the SA Study, and the BP Review and an overall report that summarized and integrated the reports of the project's research.

## ABBREVIATIONS AND ACRONYMS

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CID	Unique Child Identification Numbers
ICARE	International Child Action Research and Evaluation, LLC
ICF	ICF International, Inc.
ILAB	Bureau of International Labor Affairs (USDOL)
MDE	Minimum Detectable Effect
NE	New Era
NE-B	New Era Baseline Survey
NE-M	New Era Midyear Survey
NE-Y	New Era Yearend Survey
NGF	Nepal GoodWeave Foundation
NGF-ED	Nepal GoodWeave Foundation SIPE Eligibility Database
NGF-SA	Nepal GoodWeave Foundation School Attendance Database
NGF-YR	Nepal GoodWeave Foundation Yearend Report
NLFS	Nepal Labor Force Survey 2009
NLSS	Nepal Living Standards Survey 2003/2004
NPR	Nepal Rupee (rupees) USD:NPR exchange rate is 1: in this report.
SEP	Nepal GoodWeave Foundation's Sponsored Education Program
SIPE	Schooling Incentives Project Evaluation
USD	U. S. Dollar
USDOL	U. S. Department of Labor

## EXECUTIVE SUMMARY

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This report describes the results of a field experiment designed to understand the schooling decisions of children affiliated with carpet exporters in the Kathmandu Valley of Nepal. Random assignment was used to allocate children to a control group, a scholarship program that covered typical school costs, and a combined scholarship and stipend program where children received the scholarship plus an additional stipend that was conditional on the child attending school 80 percent of the school days in the prior month.

This field experiment was conducted as part of the "Research on Children Working in the Carpet Industry of India, Nepal, and Pakistan" (Carpet Project) that was funded by a Cooperative Agreement between the U.S. Department of Labor and ICF International (ICF). One of that project's objectives was to understand the best practices to eliminate child labor in the carpet sector, and the promotion of education has been central in efforts to deter the entry of children into child labor in the carpet sector and elsewhere. The two educational interventions examined here, the paying of school costs and the provision of economic support, have been used extensively in anti-child labor programs funded by the U.S. Department of Labor, and an important objective of this study is to pilot the use of randomized control trials to evaluate the causal impact of U.S. Department of Labor supported anti-child labor interventions.

The Nepal GoodWeave Foundation implemented the scholarship and stipend programs. This research does not assess the GoodWeave initiative as a whole, which includes several other integrated programmatic components, including inspection, monitoring and certification; child rescue, rehabilitation and long-term educational support; and other preventative programs, such as the provision of day care for the children of adult carpet weavers. GoodWeave's interest in participating in this study stemmed from the desire to better understand how its efforts to provide tuition support to children at risk of entering the work force might help to combat child labor and to consider ways to increase the effectiveness of its efforts.

The scholarship program in this study was modeled on GoodWeave's existing Sponsored Education Program. The scholarship reimbursed families up to NPR 3,950 per child for fees, tuition, uniform, or book costs for the 2010/11 school year. The stipend treatment group received this identical scholarship plus a stipend of NPR 1,000 per month in food rations if the child attended 80 percent of school days in the prior month. The amount of the stipend used in this study was roughly equivalent to the wages students typically forego by continuing school, and the evaluation of the additional stipend on top of the scholarship was motivated by field reports from GoodWeave inspectors that the scholarship alone was unlikely to foster schooling.

The use of random assignment to allocate children to the scholarship and stipend treatments met two important goals. First, GoodWeave did not have a more fair way to allocate limited funds across all of the children who met GoodWeave's standard for support. Second, random assignment allowed the authors to evaluate the impact of the scholarship and the stipend.

Random assignment was necessary to make the three study groups (control, scholarship, and stipend) ex-ante identical and comparable. Because all three groups appeared ex-ante the same, this study uses outcomes from the control group as counterfactuals for what the outcomes of the scholarship and stipend groups would have been absent those treatments.

The implementation of the project and the evaluation were successful. GoodWeave achieved 100 percent take-up in the initial month of the program and succeeded in collecting school administrative data on almost all study subjects throughout the life of the study. Most of the evaluation uses independent data collected by a Nepali survey research firm, New ERA, which did not know any subject's treatment status and had no other role in the evaluation. New ERA was able to track more than 99 percent of study subjects through the 14 months of the study. Hence, there were no problems of attrition or poor take-up that complicate the analysis of many other evaluations in this area.

Any effects of the scholarship program on schooling during the period of support were too small to be detected by this study. For boys, nearly three-fourths of the scholarship substituted for spending that their families would have otherwise spent on their education. Even though we cannot detect an effect of the scholarship alone on girls' school attendance, the scholarship increased total spending on the education of girls. Nine-tenths of the scholarship was new spending on the education of girls that would not have otherwise been spent on their education. In contrast to the scholarship only treatment, the study finds large changes in behavior as a result of the combination of scholarship and stipend. We call this combination the stipend treatment. Girls especially benefited from the stipend treatment compared to the control group and the scholarship group. School attendance rates increased 11 percent by midyear compared to the control group. By yearend, stipend subjects had 13 percent higher attendance than control and were 62 percent less likely to miss a month of school. Stipend subject were more likely to sit yearend exams and scored higher conditional on sitting for the exams than the control group. They were then more likely to pass their grade than the control population, and they were more likely to intend to reenroll the next year, after the end of support than either the control group or scholarship group. For girls in the stipend group, this increase in schooling was combined with a decrease in carpet-weaving. After the end of the year of support, stipend recipient girls were 68 percent less likely to be involved in weaving.

These effects of the stipend on schooling and work of recipients understate its impacts. Subjects who did not receive the stipend attended school more and did better on exams when there were more stipend recipients in their carpet establishment. Adults with children receiving the stipend spent less time working and devoted more money towards spending on child goods. Most intriguingly, the stipend reduced the likelihood a child was living separately from either parent by 52 percent for the full sample and 63 percent for girls even after the program ended compared to a child in the control group. We believe that children are substantially more vulnerable to all

sorts of risks and hazards when they live away from their parents. While we cannot quantify the improvement in child welfare associated with parent-child co-habitation, we suspect that the stipend treatment's impact on this outcome is perhaps the most important consequence of the treatment.

While the stipend clearly promoted schooling, decreased weaving, and protected vulnerable children even beyond the period of support by this project, there is some evidence of unintended consequences associated with the end of scholarship support. The scholarship and stipend program lasted one academic year. The yearend data collection occurred after the end of that academic year. Children from the scholarship group reported that they were less interested in attending school in the subsequent academic year, after support ended, than the control group or the stipend group. The scholarship group was more likely to work in pre-weaving carpet sector activities such as carding, washing, balling, and spinning wool for weaving than the control group. The extent of the rise in involvement in pre-weaving activities for the scholarship only group was largely in girls and older children. We found almost no older children in pre-weaving activities in the control group and very few in the stipend group. Nearly 1 in 10 of the older children in the scholarship group participated in pre-weaving activities. This increased engagement in pre-weaving activities was not associated with more work overall and may have resulted from declines in other activities including weaving. Weaving is legally a form of hazardous child labor in Nepal, but pre-weaving activities such as balling, spinning, and carding are not considered hazardous work. Hence, substitution from weaving to pre-weaving activities could be desirable. Nevertheless, it is clear that more needs to be done to understand what happens to beneficiaries when periods of support end.

The larger effects of the stipend treatment compared to just the scholarship in part reflect the differences in the magnitudes of the transfers. For boys, most of the scholarship substituted for spending that would have otherwise occurred. Hence, the scholarship for boys acted like a small unconditional income transfer. The scholarship had a clearer impact on the relative cost of schooling for girls as it resulted in a change in education spending on girls. Here, we have found that reducing the cost of education alone was not enough to increase schooling and decrease child labor in a statistically significant way. That said the scholarship treatment might have been a better use of limited resources. The magnitudes of the impacts of the stipend treatment did not increase in proportion with the stipend's additional costs. The stipend treatment could have resulted in transfers as large as NPR 15,950 per child in total over the year of support, but the scholarship treatment cost NPR 3,950. The treatment effects of the stipend treatment compared to the control were typically less than 3 times the estimated (albeit statistically insignificant) impact of the scholarship. For example, the average cost of each percentage point increase in school attendance was NPR 1,611 for the stipend and NPR 1,039 for the scholarship treatment. The stipend had detectable effects while the scholarship did not, but the statistically insignificant increase in attendance with the scholarship came cheaper. The only exception to

the cheaper impact of the scholarship was that the stipend treatment's impact on the probability a girl lives without any parent present was more than three times the impact of the scholarship.

The findings of this study have important implications for both GoodWeave's on-going efforts to keep children out of the carpet sector by promoting education and USDOL's strategy of fighting child labor through education. With regards to GoodWeave's current focus of providing scholarship support to students, we did not find evidence of that having a strong effect on schooling although it may have reduced migration and movement. This study found extremely encouraging effects of the stipend program on promoting schooling and discouraging weaving, but the stipend would require considerably more funding than currently available to GoodWeave. It is possible that better targeting of scholarship and a reexamination of the necessary cost of the stipend may improve the impact of GoodWeave spending on sponsored education. For USDOL, the important findings here are about the potential impact of withdrawal of education support given the limited funding horizon of most USDOL projects, the possibility of education interventions to delay child vulnerability, and the utility of conditional transfers in deterring entry into some forms of child labor. Of course, the findings of this study do not say anything about the impact of long-term education support and do not necessarily generalize to other contexts beyond the study subjects chosen for SIPE. That said, the issues raised by this report are potentially relevant in many contexts. Further study is clearly merited.

## MOTIVATION

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Stories of rampant child labor in the carpet industry of Nepal during the early 90s drew global attention towards the industry. Children living in establishments or households with looms are extremely vulnerable to transitioning to work on the loom. When schooling is costly and economically valuable work is readily available, the child is more likely to drop out of school and start working at an earlier age.

The purpose of the Schooling Incentives Project Evaluation, or SIPE, was to improve our understanding of the importance of schooling costs and available employment opportunities for child labor and schooling decisions among children associated with carpet producing establishments in Nepal. Children 10-16 and living in carpet producing establishments were assigned to three study groups using random assignment. Group 1 received monitoring for a 14 month study period. Group 2 received monitoring and a scholarship of NPR 3,950 per year covering schooling costs. We call this the scholarship group. Groups 3 received monitoring, the NPR 3,950 scholarship, and an additional stipend of NPR 1,000 per month that was conditional on attending 80 percent of school days in the month prior. We label this the stipend group. The amount of the stipend was one third of the earnings a child could earn in a year on the loom. Children typically did not work on looms, and the stipend amount was roughly equivalent to child earnings in other common forms of work in the study area.

Study subjects live in the Kathmandu Valley of Nepal where schooling is available, although both quality and costs are variable. A key assumption in efforts to combat child labor through promoting education is that school costs are an important reason why children enter child labor. Comparing group 2 to group 1 is informative about the impact of schooling costs on work and schooling decisions.

Carpet weaving is lucrative relative to other employment opportunities available to youths within the Valley. Nepali societal norms make employment opportunities outside of the household more scarce for women and girls compared to males, and weaving is one of the more highly paid jobs frequently held by uneducated women. Comparing group 3 (stipend and scholarship) to group 2 (scholarship) is informative about how important the child's (especially girl's) economic contribution was in the decision to drop out of school and enter employment. Both groups have their schooling costs covered. They differed only in whether earnings were partially replaced by the stipend. If schooling costs were the foremost reason children dropped out of school, then the stipend should have had little additional impact on schooling. If on the other hand the child's potential economic contribution was central in the child labor decision, then income replacement should have had a large effect on schooling and work.

The comparison of study subjects in groups 3 and 2 is especially informative about the potential welfare effects of efforts to reduce the employment opportunities open to children. Reductions in

employment opportunities lower the child's potential income contribution, and a central question in the child labor literature is the extent to which children faced with reduced employment opportunities shift to schooling or worse jobs. The stipend in group 3 reduced the return to working full time relative to school. Whether this resulted in a reduction in child labor or increase in schooling is informative about how important the child's income contribution was in the work and schooling decisions.

The importance of foregone earnings and schooling costs in school and work decisions is important for designing better policy to combat child labor in the carpet sector. The implications of this study's findings extend beyond the carpet sector in Nepal. This study's findings will be helpful in understanding the welfare consequences of policy efforts to restrict the employment opportunities available to children. If schooling costs were substantive barriers to schooling, then it is unlikely that policy actions reducing the employment opportunities available to children would lead to more schooling. Such policies would shift children to other types of work, types revealed to be worse by the laborer's original free choice of type of work. If foregone earnings are more important for schooling decisions, then reductions in the employment opportunities available to children might lead to more schooling, especially in the present case where the alternative employment opportunities available to children are far less remunerative than carpet-weaving.



## **STUDY DESIGN**

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### **2.1. PARTIES AND THEIR RESPONSIBILITIES**

The primary purpose of the Schooling Incentives Project Evaluation (SIPE) study was to evaluate the impact of scholarship and stipend programs in encouraging school enrollment and attendance and reducing child labor, especially in the carpet sector, in Nepal. The SIPE study was the first randomized controlled trial (RCT) impact evaluation of a child labor and schooling intervention to be conducted in Nepal.

SIPE was executed by ICF Macro (hereafter, “Macro”) under its "Research on Children Working in the Carpet Industry of India, Nepal, and Pakistan" contract with the U.S. Department of Labor. Macro’s collaborator, the Nepal GoodWeave Foundation’s (NGF) helped design and implement SIPE, motivated by a desire to improve the efficacy of its efforts to prevent children working on looms. NGF identified 660 children aged 10-16 years old who were the children of workers in licensee establishments and who it considered vulnerable to transitioning into child labor in carpet establishments.

International Child Action Research and Evaluation (ICARE) provided technical input on the design of the project and the analysis of findings. Eric Edmonds of Dartmouth College and Maheshwor Shrestha of MIT were involved for ICARE in design and analysis. Leigh L. Linden of the University of Texas served as a technical consultant to ICARE at the design stage. ICARE advised Macro on the design of the project, the survey instruments, and performed the technical analysis of anonymous data described herein. All of the survey data used in this document was collected by a Nepali research organization, New ERA (hereafter, NE), which had no other role in the project and was not informed of the status of any subject of their interviews. NGF also collected school administrative records that are used in this report

### **2.2. ELIGIBILITY FOR SIPE**

NGF selected 101 establishments for SIPE. The 101 establishments were NGF licensees or subcontractors of NGF licensees as of January 2010. 100 of these establishments engaged in weaving, with 1 establishment reporting finishing work and dyeing wool but no weaving. These 101 establishments had a total of 3,434 employees as of January 2010 and had completed a total of 8,464 square meters of carpet in the last 30 days.

SIPE targeted children 10-16 associated with carpet manufacturing establishments and who (a) had attended school within the last 18 months, (b) had not received education support from NGF or other sponsors and (c) were in families who faced an elevated risk of transitioning to child

labor. NGF viewed children as having an elevated risk of transitioning to child labor if they met at least one of the following three criteria:

- Family size - 3 or more school age children in family
- Total monthly family income (including monetary support from kin/relatives living elsewhere) -
  - Total monthly family income less than NPR 8,500 and housing not provided free of charge by an establishment<sup>1</sup>
  - Total monthly family income less than NPR 7,000 and housing provided free of charge by an establishment
- Sibling schooling -
  - 1 or fewer children in family attending school
  - Children in the family have dropped out of school before completing grade 8<sup>2</sup>

These criteria were chosen by NGF based on the field experience of NGF inspectors in the sponsored education program. The income criteria were also based on the minimum wage set by the government of Nepal and in effect in early 2010. The minimum wage is viewed by the government of Nepal as the minimum income needed for subsistence. The minimum wage level per person was NPR 4,600 per month.<sup>3</sup> Assuming 85 percent of children lived in households with an adult earner present, this implied that an income of NPR 8500 per month would be subsistence. The allowance of NPR 1,500 per month for rent when housing was provided free of charge by employers was based on the NGF inspectors' subjective opinion on the value of this free housing.

NGF conducted preliminary interviews with workers in carpet establishments to collect data on the children they have, their family income and other information necessary to determine eligibility of the children. For the eligible children, the income cutoff was the most important for children in the SIPE study. For the 660 children in the SIPE study, Table 1 counts the number of subjects who met each of the criteria listed above. All study subjects were 10-16, had attended school within the last 18 months, and did not receive other education support.

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<sup>1</sup> While there is some volatility of the NPR-USD exchange rate during the period of study, an exchange rate of 71.6NPR per USD is reasonable for the period of study.

<sup>2</sup> Schooling was compulsory through grade eight at the time of the project.

<sup>3</sup> Round 1 of the Labor Demand Survey in Nepal asked managers about wages necessary to hire new adult workers. Managers reported NPR 4800 per month as the wage required to hire a weaver (adult male or adult female).

**Table 1: Determinants of eligibility for SIPE, 660 study subjects**

<u>Criteria</u>	<u>Number of Subjects</u> <u>Matching Criteria</u>
Family Size	255
Low Income, no housing	234
Low Income, housing provided	396
Siblings, 1 or fewer in school	135
Siblings, Drop out	52
Total	660

Subjects could match multiple criteria. In fact, nearly two-thirds of study subjects met at least two of the criteria. 30 of the study subjects did not meet the low income criteria. Of these 30, 1 was in the study because of sibling drop-outs, 3 were in the study because 1 or fewer siblings attend school, and the remaining 27 met the family size criteria, having 3 or more eligible children in the family.

It is useful to place this subject pool in the context of the population of the Kathmandu Valley. Table 2 tabulates the demographic characteristics and time allocation of the 660 study subjects at baseline in early 2010 and the 1,699 children 10-16 living in the Kathmandu Valley and captured by the 2009 Nepal Labor Force Survey (NLFS). The NLFS was a random sample and representative of the Kathmandu Valley.

**Table 2: Demographic Characteristics of Study Subjects and the Kathmandu Valley**

	Study Subjects		Children 10-16 in the Valley	
	Mean	Std. Dev.	Mean	Std. Dev.
<i>Demographics</i>				
Age	12.274	6.158	13.132	1.972
Female	0.541	0.499	0.464	0.499
<i>Caste/Ethnicity</i>				
Brahman/Chetteri	0.070	0.255	0.381	0.486
Newar	0.053	0.224	0.282	0.450
Tamang and Magar	0.658	0.475	0.214	0.410
Dalit	0.020	0.139	0.023	0.150
Other	0.200	0.400	0.100	0.300
<i>Religion</i>				
Hindu	0.439	0.497	0.812	0.391
Buddhist	0.471	0.500	0.145	0.353
Other	0.089	0.286	0.043	0.202
<i>Schooling and participation in Work</i>				
Currently attending School	0.974	0.159	0.944	0.230
Wage work in past 7 days	0.098	0.298	0.036	0.187
Economic activity, 7d ex. collection	0.136	0.343	0.111	0.315
Economic activity, 7d inc. collection	0.852	0.356	0.125	0.331
Unpaid HH services, 7d	0.923	0.267	0.283	0.450
<i>Parent information</i>				
Mother present in HH	0.965	0.184	0.946	0.226
Mother literate (when present in HH)	0.126	0.332	0.557	0.497
Father present in HH	0.676	0.468	0.879	0.326
Father literate (when present in HH)	0.590	0.492	0.872	0.334

Source: Authors' calculations from NE-B and NLFS. Study subjects refer to the 660 children who were subjects for this evaluation. The NLFS sample is representative for children 10-16 living in the Kathmandu Valley. It is based on a sample of 1,699 children. We do not have information on parental literacy when a parent is not present in either sample.

Our subject pool was slightly younger and much more female than a random sample of children 10-16 from the Valley would be. Historically, the carpet industry in Nepal was owned and operated by people of Tibetan origin as it grew out of efforts to help the Tibetan refugee population. The Tamang language is closer to Tibetan than other languages in Nepal, and the Tamang and Tibetan historical heritages are intertwined. In fact, many Tibetans in Nepal identify themselves as Tamang. This is the reason for the greater prevalence of Buddhists and Tamang in the descriptive statistics for the subject pool. These ethnicities are not indigenous to the Valley and reflect the migratory roots of our study population.

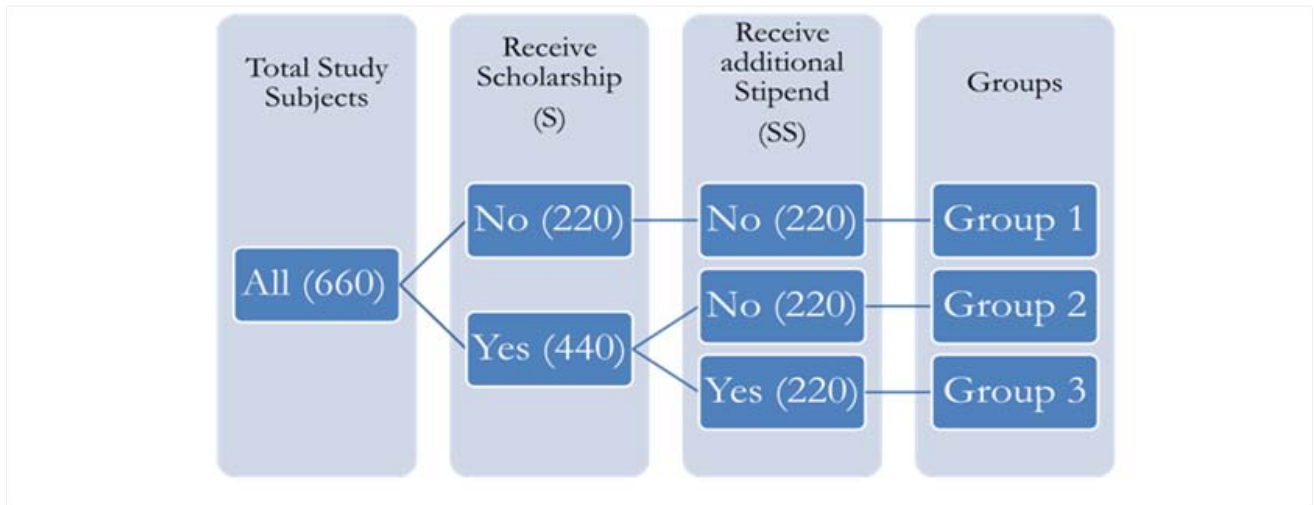
Our subject pool worked more in wage work and collection activities than 10-16 year olds in the Valley. Wage work was 3 times more prevalent among our subject pool. Economic activity rates were similar for non-collection activities, but our population was substantially more likely to be engaged in the collection of wood or water. We do not think this is a questionnaire issue, because the NE-B time allocation module is similar to the NLFS. One possibility is that the demand for wood and water was great in the proximity of carpet establishments so that children were far more likely to be engaged in these activities. Children were also more likely to be engaged in unpaid household services in our subjects. The same logic may explain this, especially as children frequently provide such services to their weaving parents. Despite this additional collection work and time in unpaid household services, our subject pool had similar school attendance rates.

Parent attributes for our study population also appear different. The mother was less apt to be literate and the father was less likely to be present. We only know literacy for resident parents, so we are unable to say for sure whether subject fathers were less literate given that they were less likely to be present. Fathers play an important role in schooling and working decisions, and the literature is not clear whether that role is positive. This difference in household structure may be central in how households respond to the treatments considered herein.

### **2.3. PARTICIPATION IN SIPE**

ICARE assisted NGF in using random assignment to allocate all 660 eligible children into three study groups for study between March 2010 and May 2011. In total, 220 subjects (children) were randomly assigned to each of the 3 study groups. Figure 1 shows the group assignment structure of SIPE.

**Figure 1: SIPE group assignment**



The subjects in different groups received different levels of assistance.

- Group #1 is the control group. The children in Group 1 received no schooling-related assistance.
- Group #2 is the scholarship group. The children in Group 2 received a scholarship benefit. NGF reimbursed each child's schooling-related costs up to a maximum of (Nepali rupees) NPR 3,950 per year. This assistance could include all schooling-related costs such as fees, tuition, uniforms, books and other supplies. This program was modeled after NGF's Sponsored Education Program.
- Group #3 is the stipend group. The children in Group 3 received the scholarship as Group #2 plus a stipend. In addition to reimbursing school-related costs up to NPR 3,950 per year, NGF provided a stipend of food rations valued at NPR 1,000 per month per child that was awarded only if the student attended school at least 80 percent of the days his or her school was open in the previous months. The stipend distribution occurred through local stores. Every child that received the stipend was given an identity card with a picture of the child and their guardian. NGF identified several local stores in the neighborhood of the recipients' residences and arranged for the holder of the identity card to receive the stipend as an in-store credit when the child met the school attendance requirements.

## **2.4. EXPLANATION OF BENEFITS**

### **1. Scholarship Amount**

The scholarship amount, NPR 3,950 was the yearly average cost for supporting one child through the NGF's own school support project in year 2008. Our calculations from the Nepal Living Standards Survey 2003/04 (NLSS) suggested that this scholarship amount was sufficient to cover schooling costs for most of the children if they attended community or government schools in the Kathmandu Valley.

### **2. Stipend Amount**

The stipend amount was comparable to the opportunity cost of the child if they chose to work instead. NPR 1,000 per month was a third of the cash earning made by a youth under 20 working in weaving in a carpet establishment and was roughly equivalent to what a child might earn working as a domestic, a common occupation of migrant children in Kathmandu. The stipend was provided as an in-store credit in shops close to recipients' residences. It was supposed to be spent on grains or pulses. In practice, it seems to have largely been spent on buying bags of rice. The amount of the stipend was chosen based on NGF field interviewers. They asked eligible families how much would be required to obviate the need for child labor and felt strongly that NPR 1,000 per month was appropriate. NPR 12,000 per year was slightly less than average expenditures on grains and pulses by the poorest thirty percent of the Kathmandu Valley according to our calculations from the NLSS. The decision to provide the stipend in grains and pulses rather than cash was requested by the funder of this project. The decision to provide the stipend as in-store credit rather than to have NGF directly distribute grains and pulses was made for logistical reasons.

## **2.5. STUDY SIZE DETERMINATION**

Based on interviews with NGF inspectors in the fall of 2009, ICARE was informed that roughly two thirds of children 10-16 in carpet establishments attended school. NGF inspectors conducted qualitative interviews to gauge the expected take-up and school attendance rates for children offered the stipend. NGF believed 96 percent of children offered the stipend would attend school. This implied that 41 children needed to receive the stipend plus scholarship in order to test the null that stipend plus scholarship had no effect on schooling relative to simply monitoring the child's schooling status with 90 percent power.

To test the difference the stipend makes in schooling attendance, it was important to have a guess as to the impact of the scholarship alone. NGF inspectors argued that schooling costs were small

enough that relatively few families were moved to schooling based on the scholarship alone. A 5 percentage point effect seemed plausible given their interviews. This would imply needing 1852 study subjects receiving the scholarship alone and another 1852 receiving no treatment in order to identify a 5 percentage point effect with 90 percent power. Such sample sizes were greater than the number of eligible children. Instead, the 220 scholarship only and 220 control households implied an ability to detect a 5 percentage point effect with 17 percent power.

Since the key focus of SIPE was testing the stipend plus scholarship against the scholarship alone, the sample size needed to be sufficiently large to detect the difference between 71 percentage point attendance (with the scholarship) and 96 percent enrollment (with scholarship and stipend). 52 children needed to receive the scholarship plus stipend and 52 needed to receive the scholarship alone in order to have 90 percent power in detecting this 25 percentage point increase in attendance.

The sample size of 220 per treatment group was arrived at in order to test the null hypotheses separately by gender, by age group, and by carpet establishment size. For age group, we divided children into young and old. We defined young children as 10-13 and old children as 14-16 at baseline. We defined an establishment's size based on whether it had completed more than the median output of carpets in the last 30 days (100 square meters).



## **EMPIRICAL METHODS**

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### **3.1. DATA SOURCES**

#### **1. NGF Eligibility Data, NGF-E**

In February 2010, NGF collected data on all employers, workers, and their children who were potential study subjects. This information was used to assess eligibility for SIPE and to test the validity of the randomization used to assign individuals to each of the three treatment groups.

#### **2. NE Baseline Survey, NE-B**

In March 2010, NE conducted the baseline survey of all 660 study subjects and their families. ICARE, Macro, and NE developed the baseline survey. It contained a detailed, multipurpose household survey for the families of all study subjects. It also included a detailed child survey that collected information on the child's well-being, her role within the household, and measures literacy and numeracy.

#### **3. NGF School Records, NGF-S**

In April 2010, NGF informed study participants about their status in the project and obtained consent forms for NGF to contact the schools of study participants. At this time, NGF contacted schools and obtained information about the academic performance of all study subjects during academic year 09/10. Starting in May 2010, NGF provided monthly reports on the schooling status and monthly attendance rates of all study subjects. After the completion of the 2010/11 school year, NGF provided ICARE and Macro a yearend report that summarized the schooling status of all 660 study subjects at yearend and reported their attendance and performance on year-ending exams.

#### **4. NE Midyear Survey, NE-M**

Before the October holidays in 2010, New Era conducted a midyear survey for all 660 study subjects and their families. The survey consisted of a household survey that was similar to the baseline survey's household survey. In the midyear survey, NE located survey children who have moved from one location to another within the Kathmandu valley, but NE did not track the 22 study subjects who departed the Kathmandu Valley in the midyear survey.

## 5. NE Yearend Survey, NE-Y

NE conducted a final survey after the conclusion of the school year that ended in March 2011. The survey consisted of household and child surveys that were similar to the baseline surveys. In addition, NE tracked and surveyed (household and child) subjects who migrated out of the Valley. All subjects in treatment groups had received the final disbursement before the start of the yearend survey. Hence, conditionality was no longer a relevant influence on behavior.

### 3.2. RANDOMIZATION

#### 1. Implementation of Random Assignment

In order to make sure that comparison between treated and control populations represent causal differences, randomization was used to assign eligible individuals to treatment groups. NGF provided ICARE with anonymous identifiers for the 660 study eligible children on March 30, 2010. ICARE was not able to determine the identity of any potential subjects. Coupled with the anonymous CID numbers were the associated data collected by NGF in NGF-E.

In ICARE offices in Hanover, NH, the 660 eligible children were stratified into sub-groups based on their age (old v. young), gender, and carpet establishment size (above v. below median carpet area in the last 30 days). This created a full set of age-gender-establishment size cells. For each cell, children were randomly allocated to the three treatment types. Random assignment within each cell occurred by assigning each child a random number drawn from a uniform distribution bounded between 0 and 1. Within each cell, this random number sorted children. The bottom third were defined as the monitoring population, the middle third received the scholarship, and the highest third received the scholarship and stipend combined. There was no guarantee that the number of children in each cell would be divisible by 3. When not, children were assigned to treatment populations to make sure that the number of children receiving the scholarship in each cell matched the number of children receiving the combined scholarship and stipend. Balance in number between scholarship recipients was prioritized as the comparison of the scholarship v. scholarship plus stipend was the primary goal of this study.

With the overall small sample size, it was important to use the worker and employer fact sheet data NGF-E provided to ICARE by NGF to verify that the randomization was effective in creating comparable treated populations. ICARE provided NGF with the analysis described in the next section. However, in order to make sure that the design was valid, ICARE iterated the randomization 14 times until it achieved an assignment that was balanced with respect to all observable covariates. This iterative process was implemented by generating random starting seeds for the random draw of the sorting variable from the previous paragraph. The iterative process stopped on the first assignment that appeared balanced, meaning the treated populations appeared comparable in every treatment population.

On March 30, 2010 ICARE provided NGF with a list of treatment assignment, CID, EID, age, and gender for the 660 study children. This list was the basis of the validation discussion in the subsequent section.

## 2. Validation of Randomization

Randomization served two purposes. First, it was the only fair way to allocate benefits between two otherwise identical, eligible recipients when resource constraints limited the availability of funding. Second, it provided a straightforward way to estimate what would happen to treated subjects absent the treatment. More precisely, randomization assured that the underlying distribution of observable and unobservable characteristics were identical across treatment categories in expectation. With small study populations such as this, it was important to evaluate the success of the randomization by examining whether predetermined background characteristics were comparable across study groups.

The sample was divided into 3 groups. We examined the validity of the randomization by comparing each group to the other two groups combined. That is, we examined whether a characteristic in the control population differed from what we observed in the combined populations that received assistance or whether a characteristic in the stipend population differed from the combined control and scholarship populations. Since our focus was on comparing the scholarship treatment to the scholarship plus stipend population, we also tested for differences between those two treated groups (without also including the control population). These comparisons are in Table 3.

Table 3 shows the validity of the randomization across the individual, household, and establishment characteristics collected in NGF-E. Each cell in columns 1 -3 contains the mean of the indicated (row) variable for the indicated (column) treatment group. Each cell in column 4 contains the P-Value associated with the null hypothesis that the difference in means between columns 2 (the scholarship treatment group) and column 3 (stipend treatment group) is zero. The F-statistic at the bottom of columns 1-3 is for the null that the difference between the means in the column and those of the population in the other columns, taken jointly, is zero. The F-Statistics at the bottom of column 4 is for the null that the difference in means between the scholarship and the stipend groups are jointly zero. The P-value is the p-value associated with the F-statistics.

A few characteristics in Table 3 require explanation. The study contained more females than males. This reflects the population resident in carpet establishments. By the time children reach puberty, males were less likely than females to stay resident with parents in the carpet establishment. Roughly 70 percent lived within the walls of the establishment where they worked. These establishments were large with an average 41 workers. More than half of study children were in establishments whose total output was below the median of the establishments we observe. More than 1 in 5 of the establishments engaged in post-weaving finishing work in

addition to weaving. Wool preparation activities were less frequent in weaving establishments. Daycares, scholarships, and health checks existed in the study population.

**Table 3: Child, Family and Establishment Characteristics by Treatment Status**

	Control (1)	Schol. (2)	Sch + Stip. (3)
Age	12.27	12.37	12.31
Female	53.64	54.55	54.55
Completed Education	4.25	4.12	4.18
Lives in Establishment	71.36	70.45	69.09
Number of Children	2.36	2.28	2.35
Match Child Selection Criteria	40.91	34.55	40.45
Receives Free Housing	63.64	63.64	60.45
Family Income	4.67	4.93	4.72
Match Income Selection Criteria	96.82	94.55	95
Number of Children School Age	2.26	2.19	2.23
Has Drop Out	7.27	7.73	8.64
Matches Sibling Schooling Selection Criteria	19.09	21.36	20.91
<i>Establishment Characteristics</i>			
Number of Workers	41.18	41.7	41.14
Weaving Output in Sq. Meters in Last 30 Days	92.71	95.29	94.24
F-Stat on Joint Significance of Covariates above	0.41	0.55	0.18
P-Value associated with F-Stat	0.99	0.95	1.00

Source: ICARE calculation using NGF-E.

Table 3 does not present any reason to be concerned about problems with the randomization. There do not appear to be any substantive differences in population characteristics across the different treatment groups. Moreover, when the differences are considered jointly, as is appropriate given the non-independence of variables, they are jointly insignificant with P-Values very close to 1.

The analysis plan examined balance across all covariates examined in this study for the full sample and for each sub-stratum using the New Era baseline data (NE-B). When consider jointly, we failed to reject the null that the scholarship group has the same background characteristics the scholarship and stipend group, and that each of the two treatment groups have the same background characteristics as the control group (Edmonds and Shrestha 2010). This support for the validity of the randomization in the baseline data held up for the full sample, boys, girls, younger children, older children, small establishments, and large establishments.

### 3.3. EMPIRICAL METHODS

It is important with any randomized control trial to specify how the data will be analyzed before the results are available to researchers. This protects against choosing empirical methods that lead to statistically significant results. ICARE created an analysis plan immediately upon receiving the baseline data from New Era and before the midyear data was available (Edmonds and Shrestha 2010). This section reviews the empirical approach stipulated in the Analysis Plan and implemented below. The Analysis Plan document is available from ICARE upon request.<sup>4</sup>

#### 1. Direct Effects

The SIPE study was small in scale because of limited resources. The sample size was chosen to have statistical power with regards to answering one question. Specifically, SIPE was engineered to test the null hypothesis that the scholarship plus stipend provided no impact on school attendance relative to just the scholarship. This focus was chosen in discussions with NGF, because it was directly relevant to NGF's school promotion efforts. The scholarship portion of SIPE was identical to their Sponsored Education Program, or SEP, and this null hypothesis was equivalent to asserting that schooling outcomes would not be improved by providing additional financial support for earnings that would be foregone by attending school rather than working full time. The sample size of 220 per treatment group was chosen to test the null hypothesis separately by gender, by age group, and by carpet establishment size.

The study size was chosen to be able to detect differences in school attendance between the scholarship and scholarship+ stipend treatments using a simple comparison of means in the yearend data. In what follows, we report the yearend means across the three treatment categories. We have chosen to conduct hypothesis tests using a full set of control variables. The use of regression methods and controls was described in the Analysis Plan. This Plan was motivated by the view that regression methods reduce conditional variance and improve statistical power. In this document, we report only the raw means and the results of hypothesis testing (based on the regression results). The regression results that are responsible for this hypothesis testing are provided in full with discussion in the Technical Report available from ICARE upon request.

The stratified randomization was performed in order to make comparisons across three subgroups: gender, age, and establishment size. In what follows, we present results separately by gender and age. The Technical Report details formal regression methods design to test for differences across these subgroups, but for this document we chose to tabulate separately across groups. We omit establishment size in this report (but not the technical report). The

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<sup>4</sup> Requests for ICARE Reports should be made through the U.S. Department of Labor's Office of Child Labor, Forced Labor, and Human Trafficking. ICARE Reports cannot be released without prior USDOL approval.

stratification does not appear to be meaningful. There are few differences that are significant when split by establishment size.

## 2. Spillovers

Another important dimension to the impact of SIPE is its spillover to control subjects or non-study subjects. Spillovers to control subjects create estimation problems. Spillovers to non-study subjects provide an interesting nuance to the extent of program effects. The Technical Report provides more information on the extent of spillovers in non-study subjects. Here, we focus more on study subjects because of the implications of spillovers for interpretation.

When treated children are in the same family as control children, the apparent impact of the program would be attenuated if benefits were shared. We expected this type of within household spillover, but we have difficulty measuring it as two-thirds of subjects were the only subjects within their household. We do not have a prior belief about the extent of sharing within an establishment, but such sharing is plausible. In fact, there may have been mechanisms in place to force such sharing within establishments given the engagement of Maoists with the carpet labor force. Spillovers of this type may bias our estimates of the effect of the stipend. We have a lot more scope to detect this type of spillover as only 5 subjects were associated with an establishment without other subjects present. For the remaining, 655 subjects, there were potentially establishment spillovers.

In examining spillovers, it is important to differentiate the effect of having more eligible children present from having more treated children present. A regression of outcomes on the number of treated children present controlling for a subject's own status would confound the effects of spillovers and whatever drives some establishments or households to have more eligible children present. Thus, it is critical in examining spillovers to control for the number of eligible children present and the subject's own treatment status at the same time. This is done with regression methods in the Technical Report. In what follows, we focus our spillover tabulations on the control sample and look for spillovers, holding the number of eligible individuals present fixed.

## RESULTS

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In what follows, we summarize our key findings. The Technical Report has full detailed results for all measured outcomes and all hypotheses posited in the Analysis Plan.

What are the key outcome variables at yearend? When there are more than 9 ways to measure school attendance at yearend, it is obviously somewhat arbitrary as to which measure we define as “key”. In the present case, we proceed with the rule of thumb that we define the “key” outcome variables as being those most central and direct in interpreting our findings about the impact of the two treatments on schooling and child labor in the carpet sector. The choice of outcomes to emphasize is subjective and not pre-specified in the Analysis Plan. We are subject to the critic that these have been labeled “key” in part because of the study’s findings.

Because of the balanced randomization documented above, the value of outcomes in our control group at yearend is a valid counterfactual for our two treatment groups. Thus, a simple comparison of means at yearend gives a close approximation of the differences that will be observed using variance reducing regression methods in the Technical Report. When we report the means, we also report the statistical significance of the difference in means that stems from these methods. We present tables of means for the full sample in sub-section A followed by the gender and age sub-strata.

Before we turn to our results, it is important to consider whether our discussion could be biased by selection attrition from our sample. Attrition does not appear to be a concern at yearend. The NGF eligibility information, NGF-E, and the NE baseline survey NE-B collected several pieces of useful information for contacting student and locating their families if they were to move. As a result, of the 660 children and 453 families that we started out with, NE was able to interview all but five children. Of the five, two were in the scholarship group, two were in the stipend group, and one was control. One child died after the baseline survey (from the stipend group) and two children migrated out of the country for employment. Of the remainder, one child eloped during the yearend survey and the parents were unaware of her whereabouts. The last of the missing children, along with her family, could not be located by NE. When NE tried to locate the missing child, they discovered that her family was ‘on-the-run’ because of outstanding debts, and neither other workers nor the employer knew the whereabouts of the family.

This information was cross-validated with NGF-S school records. Though some of these missing children had been to school initially, they dropped out in the middle of the year and none of them stayed in their schools till the final examinations. Except for the case of one child who was missing along with his family, New ERA was able to interview the families of the rest of the missing children.

Regarding interviews with the families, New Era was able to interview 450 out of 453 households. One of the missing households is the debtor household described above. The other

two households could not be interviewed as they moved for employment abroad leaving the program child behind. Interestingly, the program children in those families have been living with friends of their parents who also happened to be part of our sample. The three missing households come from all three of the treatment groups (1 household each).

Given recapture rates above 99 percent, our discussion does not focus on issues associated with attrition any further in this report.

#### 4.1. FULL SAMPLE FINDINGS

We emphasize 11 outcomes as our key outcome variables for this study. These outcomes concern the child's migration status, school attendance, school performance, school progression, education expenditures, and child involvement in the carpet sector. Table 4 contains the yearend means of these 11 outcomes by treatment status.

**Table 4: Key Outcome Variables at Yearend by Treatment Status**

	Control	Scholarship	Scholarship & Stipend
	(1)	(2)	(3)
Child not living with parents (%)	7.7	4.5	3.7**
Total attendance Rate, NGF (%)	81.1	84.9	91.0**^^
Child missed a calendar month of school, NGF (%)	20.9	14.2	7.8**^^
Child appeared in final exam, NGF (%)	87.3	89.4	95.9**^^
School Test score (level)	49.7	53.0	54.2**
Failed current grade (%)	13.5	7.2*	7.2**
School enrollment in subsequent year (%)	97.3	94.1*	97.3
Total Educational Expenditures on Child (NPR)	6949	5395**	5769**
Total Educational Expenditures on Child including scholarship (NPR)	6949	9031**	9553**
Child involved in pre-weaving activities, L7d (%)	1.8	5.0**	2.8
Child involved in weaving carpets, L7d (%)	7.3	5.5	3.7

Note: Asterisks indicate significance of test that the regression adjusted mean for the indicated treatment category equals the regression adjusted mean for the control group using the regression approach described in equation (2) of the Technical Report. \*\*  $p < 0.05$ , \*  $p < 0.1$ . Caret marks indicate significance of the test that the regression adjusted mean for the scholarship + stipend treatment equals the regression adjusted mean for the scholarship only treatment using the regression approach described in equation (2) of the Technical Report. ^^  $p < 0.05$ , ^  $p < 0.1$  For complete details and parameter estimates see section V of the Technical Report. All regression work and hypothesis testing on expenditures use the log of expenditures as the dependent variable although the table reports levels. Source: ICARE estimates from NE-Y and NGF-S

The first row of Table 4 summarizes the prevalence of a child not living with any parent at yearend. 7.7 percent of control subjects lived without a parent present. 4.5 percent of scholarship subjects lived without a parent present. 3.7 percent of the stipend subjects lived without a parent present. If the difference between control subjects and stipend subjects is causal



and the control mean is a counterfactual for stipend and scholarship subjects absent any treatment (two conditions that follow from a valid randomization), we can say the stipend treatment reduced the incidence of a child living without a parent at yearend by 52 percent. Asterisks report the statistical significance of the null that a treatment group did not differ from the control group. Carets report the statistical significance of the null that the stipend group did not differ from the scholarship group. Thus, the stipend treatment reduced the incidence of a child living without a parent present compared to no treatment, but we cannot reject the null that the stipend had no impact on the incidence of a child living without a parent present compared to the scholarship.

We have three outcomes in Table 4 that relate to attendance. All three are consistent with large effects of the stipend on attendance, and differences between the stipend and scholarship treatments. The total attendance rate comes from the NGF-S database, and it is the fraction of open school days attended by the child over the year of the support. Control subjects attended school 81 percent of open days. Scholarship subjects attended 85 percent, and stipend subjects attended 91 percent. This implies that the stipend increased school attendance by 12 percent compared to the control group and 7 percent compared to those that only received scholarship support. The effects of the scholarship support alone on attendance were too small to detect in our design. The two other main attendance measures (missing a month of school, completing the year and sitting for final exams) were similar in character.

We have two measures of schooling achievement. The school test score is the child's final score on the in-school, yearend exam, pooled across school subjects. We observe higher test scores in the scholarship and stipend groups compared to the control group. We can reject the null that there was no impact of treatment on test scores compared to the control group for the stipend group only. The data do not reject that the increase in test scores associated with the scholarship was the same as the increase in test scores associated with the stipend. The other achievement measure is whether an individual fails. We find reduced failure compared to the control group in both the treatment groups, and the treatment groups had the same failure rates.

The fact that we observed larger increases in test scores for the stipend group compared to the scholarship group but identical failure rates implies that the rise in test scores for the stipend compared to the scholarship is in students who were not at risk of failure. If the improvement in test scores were moving children between passing and failing, we should have observed that better test scores led to reduced failures. Since failure rates are the same across treatment groups, the higher test scores associated with the stipend treatment must have been among students who were not at the margin of passing. The reduction in failure rates for the treatments was large – a 46 percent reduction in failure compared to the control. 30 students failed in the control group compared to 16 failures in the scholarship treatment group and 16 failures in the stipend group.

The yearend data was collected in the interterm between school years. We did not observe whether the decline in failures lead to greater reenrollment, but we asked subjects whether they intended to enroll in school in the next school year. Interestingly, the scholarship only treatment group answered more in the negative. They were less apt to report that they would enroll in school in the coming year compared to either the control group or the stipend group.

Information on educational spending is critical for understanding and interpreting the schooling results. Hence, while we were not interested in educational spending per se, we felt movements in educational spending needed to be understood to interpret the scholarship only treatment. We tabulated total education expenditures on study subjects without and with the scholarship. The scholarship amount was NPR 3950 per student per year. We find that scholarship recipients decreased out of pocket (non-reimbursed) education spending by NPR 1554. Hence, 40 percent of the scholarship was saving of education expenses that would have otherwise occurred. Scholarship subjects in total spent NPR 9031 on education. Thus, the scholarship increased per student education spending by NPR 2082 per year. Interestingly, the reduction in out of pocket plus the additional spending for the scholarship group added to NPR 3636. Hence, NPR 314 or 8 percent of the scholarship was diverted to other spending.

The impacts of the stipend on education spending compared to the stipend group and control group are also interesting. As with the scholarship, part of the stipend group's scholarship was diverted into other spending. The magnitude was smaller: NPR 166 or 4 percent of the scholarship. However, the fact that the stipend group reduced out of pocket expenditures by less than the scholarship group implies that the stipend resulted in some additional education spending compared to what we would see with only the scholarship. That said, the small and statistically insignificant increase in education spending for the stipend group compared to the scholarship group was not enough to account for the higher rates of school performance and attendance that we observed in the stipend group compared to the scholarship group.

The children in this study were proximate to carpet weaving establishments that were GoodWeave licensees. Hence, child involvement in the carpet sector was a central motivation for this project. We focus on two measures of involvement in the carpet sector: involvement in pre-weaving activities such as carding, balling, spinning, and washing wool and weaving. We focus on these two types of engagement in the carpet sector as they appeared most prevalent. We focus on child involvement in the last 7 days as our reference period, because we think the shorter recall is more accurate and informative about the child's future than a lagged measure assembled over activities in the prior year. Participation in weaving was 49 percent lower in the stipend group compared to the control group although the data cannot reject the null hypothesis that the difference in weaving participation between the stipend and control group was zero. Pre-weaving activities were slightly more prevalent in the stipend group compared to the control group. Surprisingly, the scholarship group was more likely to engage in pre-weaving activities compared to the control group. This elevated incidence of pre-weaving activities was significant

at 10 percent. We view this rise in pre-weaving activities as a puzzle, a fraction of which might come from decreased weaving involvement. Pre-weaving activities were not considered hazardous child labor in Nepal whereas weaving was. Hence, a substitution from weaving into carding, spinning, and balling could have been desirable from a policy perspective. The increase in pre-weaving could also be related to the reduced reports of continuing in school in the scholarship group rather than a substitution away from weaving.

A closer look at various subgroups sheds light on this increase in pre-weaving activities. It was typically larger than the decline in weaving, so it was unlikely to be diversion from weaving into pre-weaving activities. It was most prevalent in older children where the diminished educational aspirations of the scholarship group were also most pronounced.

## **4.2. FINDINGS BY GENDER**

We examine these key results for different sub-strata in the next three tables. Table 5 contains yearend means of these key outcome variables for boys and girls separately. The variables are identical to Table 4, and the columns and presentation of hypothesis test results exactly match Table 4. The only difference in Table 5 compared to Table 4 is that we now have six columns. The first 3 columns contain yearend means by treatment status for boys. The last 3 columns contain yearend means by treatment status for girls.

**Table 5: Key Outcome Variables at Yearend by Treatment Status and Gender**

	Boys			Girls		
	Control	Schol.	Schol. + Stipend	Control	Schol.	Schol. + Stipend
	(1)	(2)	(3)	(1)	(2)	(3)
Child not living with parents (%)	8.9	2.9*	5.1	6.7	6.0	2.5*
Total attendance Rate, NGF (%)	80.1	84.3	88.7**	82	85.5	92.8**^^
Child missed a calendar month of school, NGF (%)	21.8	16.3	11.5*	20.2	12.3*	5.0**^^
Child appeared in final exam, NGF (%)	87.1	89.4	93.8*	87.4	89.5	97.5**^^
School Test score (level)	48.7	54.5	51.7	50.5	51.6	56.1**
Failed current grade (%)	13.6	5.4	10.0	13.5	8.8	5.1**
School enrollment in subsequent year (%)	97.0	94.2	96.9	97.5	94.0	97.5
Total Educational Expenditures on Child (NPR)	8065	5197**	5676**	5995	5576**	5843**
Total Educational Expenditures on Child including scholarship (NPR)	8065	8881*	9474**	5995	9168**	9616**
Child involved in pre-weaving activities, L7d (%)	2.0	3.9	1.0	1.7	6.1*	4.2
Child involved in weaving carpets, L7d (%)	4.0	2.9	4.1	10.2	7.8	3.3*

Note: Asterisks indicate significance of test that the regression adjusted mean for the indicated treatment category equals the regression adjusted mean for the control group using the regression approach described in equation (2) of the Technical Report. \*\* p<0.05, \* p<0.1. Carets indicate significance of the test that the regression adjusted mean for the scholarship + stipend treatment equals the regression adjusted mean for the scholarship only treatment using the regression approach described in equation (2) of the Technical Report. ^^ p<0.05, ^ p<0.1. For complete details and parameter estimates see the Technical Report's Appendix 4.1 for boys and 4.2 for girls. All regression work and hypothesis testing on expenditures use the log of expenditures as the dependent variable although the table reports levels. Source: ICARE estimates from NE-Y and NGF-S.

The effects of the stipend treatment compared to the control were larger for girls although the larger effects for girls were often small in magnitude. For example, the stipend reduced the prevalence of a child living without a parent by 4.2 percentage points for girls and 3.8 percentage points for boys. School attendance increased by 10.8 percentage points for girls and 8.6 percentage points for boys.

There were a few cases where the impact of the stipend treatment compared to the control was larger for girls. The probability a child missed an entire month of school declined by 15.2 percentage points for girls and 10.2 percentage points for boys. Total education spending for girls increased by NPR 3621, but it increased by NPR 1409 for boys. A similar amount was spent on education for boys and girls with the stipend treatment, but the control group spending was lower for girls, accounting for the larger difference.

Carpet-weaving declined with the stipend compared to the control for girls only. 10.2 percent of girls participated in weaving in the control group. 3.3 percent of girls in the stipend group participated in weaving, a 68 percent decline. The sample size was not large enough to estimate treatment effects by age and gender, but the decline in weaving in the raw data among girls was largest for girls age 15 and 16 at baseline. 1 in 3 girls age 15 were weavers in the control group. Half of girls age 16 were weavers in the control group. No girls age 15 or 16 were weaving in the stipend treatment group.

For boys, the data never reject the null that the stipend had the same impact as the scholarship treatment. For girls, the data suggest that the stipend promoted school attendance in ways that the scholarship alone did not. Compared to the scholarship, the stipend led to higher attendance rates, reduced prevalence of missing a month of school, and increased appearance for the final exam among girls. Although the data do not reject the null that the decline in weaving was the same in the scholarship and stipend treatments, the magnitude of the decline in weaving among girls was larger for the stipend treatment.

There is some evidence that the scholarship treatment increased involvement in pre-weaving activities for girls. 1.7 percent of girls participated in pre-weaving activities in the control group. 6.1 percent of female scholarship recipients participated in pre-weaving activities. This increase in pre-weaving among scholarship recipients cannot be explained completely by a substitution away from weaving into pre-weaving activity. The prevalence of weaving declined by 2.4 percentage points for the scholarship treatment. Pre-weaving engagement increased by 4.4 percentage points. The rise in pre-weaving engagement with the scholarship treatment may have been a combination of some girls shifting out of weaving into more flexible pre-weaving activities and some discouraged girls, those who report that they would not enroll in school in the next year, taking up pre-weaving activities. The data were not clear about how to think of this rise in pre-weaving among the scholarship group.

#### **4.3. FINDINGS BY AGE**

The rise in pre-weaving activities and the decline in carpet weaving were concentrated in older children. Table 6 mimics Table 5 in its content and structure. The key difference is that in Table 6 the sample is bifurcated by baseline age rather than gender. Children 10-13 at baseline are labeled young. 14-16 are “old.”

**Table 6: Key Outcome Variables at Yearend by Treatment Status and Age**

	Young			Old		
	Control	Schol.	Schol. + Stipend	Control	Schol.	Schol. + Stipend
	(1)	(2)	(3)	(1)	(2)	(3)
Child not living with parents (%)	7.2	3.1	3.6*	9.4	8.8	4.0
Total attendance Rate, NGF (%)	82.2	88.7**	92.3**^^	77.8	73.6	86.7^^
Child missed a calendar month of school, NGF (%)	20.4	8.6**	7.1**	22.6	30.9	10.2^^
Child appeared in final exam, NGF (%)	88	93.9	97**	84.9	76.4	91.8^^
School Test score (level)	50.2	54.9*	56.6**	48.2	46.1	45.4
Failed current grade (%)	15	5.2**	4.3**	8.9	14.3	17.8
School enrollment in subsequent year (%)	98.2	96.9	98.8	94.3	86	92
Total Educational Expenditures on Child (NPR)	6285	5269**	5409**	9108	5784**	6966
Total Educational Expenditures on Child including scholarship (NPR)	6285	8946**	9191**	9108	9296	10758*
Child involved in pre-weaving activities, L7d (%)	2.4	3.1	1.8	0.0	10.7**	6.0*
Child involved in weaving carpets, L7d (%)	4.2	3.1	1.8	17.0	12.5	10.0

Note: We define young children as 10-13 and old children as 14-16 at baseline Asterisks indicate significance of test that the regression adjusted mean for the indicated treatment category equals the regression adjusted mean for the control group using the regression approach described in equation (2) of the Technical Report. \*\* p<0.05, \* p<0.1. Carets indicate significance of the test that the regression adjusted mean for the scholarship + stipend treatment equals the regression adjusted mean for the scholarship only treatment using the regression approach described in equation (2) of the Technical Report. ^^ p<0.05, ^ p<0.1. For complete details and parameter estimates see the Technical Report's Appendix 4.2 for younger subjects and 4.3 for older subjects. All regression work and hypothesis testing on expenditures use the log of expenditures as the dependent variable although the table reports levels.

Source: ICARE estimates from NE-Y and NGF-S.

The improvements in schooling were largest and statistically significant for young children. For example, the attendance rate for young control children was 82 percent. The scholarship increased attendance among young children by 6.5 percentage points, and the stipend increased attendance by an additional 3.6 percentage points or 10.1 percentage points compared to the control. For older children, the scholarship was associated with a decline in attendance and the stipend increased attendance by 8.9 percentage points compared to the control. The scholarship reduced the prevalence of missing a month by 11.8 percentage points for the young whereas missing a month increased for older scholarship recipients. The stipend reduced missing a month by 13.3 percentage points for younger children and 12.4 percentage points for older children.

The changes in work in the carpet sector were largest among older children. Involvement in pre-weaving activities with the scholarship increased by 10.7 percentage points compared to the control group for older children and by 0.7 percentage points for younger children. The decline in weaving was also larger among older children (although not statistically significant). For the young, the prevalence of weaving reduced by 1.1 percentage points for the scholarship and 2.4 percentage points with the stipend. For the older age group, weaving declined by 4.5 percentage points for the scholarship treatment and by 7 percentage points for the stipend treatment compared to the control. As we saw with gender, a portion of the rise in pre-weaving with the scholarship may have been diversion from weaving activities, but that cannot explain the magnitude of the rise in pre-weaving activities for the scholarship group. The data seem consistent with some children in the scholarship group having diverted away from schooling into pre-weaving as well as some diverting from weaving into pre-weaving compared to the control. In contrast, the rise in pre-weaving among the stipend group was smaller than the decline in weaving.

In general, the differences between the stipend and scholarship treatment effects on schooling were larger for older children. We reject the null that the scholarship and stipend treatments had the same impact on missing a month and appearing for the final among older children but not for younger children. The magnitude of the rise in schooling attendance rates with the stipend was 45 percent larger than the scholarship among younger children, but the effect of the stipend on attendance compared to the control moves in the opposite direction of the scholarship treatment for older children.

#### **4.4. SPILLOVERS**

The Technical Report documents several types of within family spillovers. While the stipend receipt does not have a clear, robust effect on the economic activity of subjects, it seems to have reduced the economic activity of adults in their households compared to the scholarship population at midyear and compared to the control population at yearend. Similar to this decline in adult economic activity, having more stipend subjects within an untreated child's household decreased the child's activity rate at yearend even though being a stipend recipient did not clearly impact the subject's yearend economic activity rate. Within family spillovers are widely documented in the case of other transfer programs such as Mexico's Oportunidades (for example, Angelucci 2011). This effect of having more stipend recipients present in the household that is larger than the impact of receiving the stipend is consistent with other studies that have documented high income elasticities for experimental variation in income (for example, Edmonds and Shady 2012).

Establishment level spillovers also appear salient. Many of our subjects lived within carpet producing establishments that house multiple families. Out of the 660 study subjects, 429 children lived within the establishments. This means 61 out of the 101 establishments had more

than one treated family living inside its premises. The rest of the households that did not reside within the premises lived close to the establishment.<sup>5</sup> It is plausible that there could have been considerable pooling of resources within establishments. Families within the same establishment were often from similar locations, and this is a natural population for risk pooling as the nature of carpet production already forces some income sharing across individuals in the same establishment. Other studies of conditional transfers have documented income sharing between recipient and non-recipient households that co-reside within the same village (Angelucci and De Giorgi 2009). Moreover, during the time of our study the Maoist organizations were especially active among carpet workers. NGF has a long history of good relationship with labor organizations, and Maoists were supportive of the project. However, it could be that the organizations encouraged some income pooling within establishments that might especially change the impact of the stipend.

There is consistent evidence of within establishment spillovers that effect schooling. For example, in Table 7 we restrict the sample to the control population who did not receive either scholarship or stipend support. We report school attendance rates for the year of support from the NGF school database.

**Table 7: Establishment Spillovers in School Attendance Rates of the Control Population**

Number of Stipend Eligible Children in Establishment	Number of Stipend Recipient Children in Establishment						
	0	1	2	3	4	5	6
1							
2	96.1	87.9					
3	66.2	88.3					
4	47.2	85.3	93.7				
5	80.5		88.9	94.3			
6		68.9	75.7	96.4			
7	84.0	89.7	82.4	89.6			
8		58.4	89.8	90.0			
9		93.1		45.7	87.0		
10			68.4	96.3	91.0		
11			64.9	99.0	77.6		
13						78.3	94.6
14						70.9	97.1

Source: ICARE estimates from NGF-S. Cells with 0 or 1 observation are not pictured. Cells with more than 14 eligible or 6 recipients not pictured.

<sup>5</sup> More than 90 percent of the children who do not live in the establishment premises live within 1km of the establishment. More than half live within 100m. Given this closeness in living arrangements amongst the workers in an establishment, we believe that is plausible that the network among workers in same establishment continues to be relevant even when workers are residing outside establishment walls.



The control sample is divided into cells based on the number of children in the establishment that met GoodWeave's eligibility rules at baseline and the number of Stipend lottery winners in the establishment. An empty cell means that there were no subjects in that cell.

Differences in school attendance rates across rows in Table 7 reflect how school attendance rates differed in establishments with more children that met GoodWeave's eligibility requirements. It is not a causal relationship. Across columns within a given row, we observe what happens to school attendance rates for the year of support as we convert eligible children within the establishment to stipend winners. This is a causal relationship. Because the sample is restricted to the control group, the differences within a row are not the effect of the stipend on its recipient. Rather, they reflect spillovers to control subjects by converting establishment children from the control group to the stipend-winning group. Generally, school attendance rates decline as eligible children are converted to stipend winners. For example, in establishments with four eligible children, the control group attended 47 percent of days during the year of support when there was no stipend winner in the establishment, 85 percent of days when there was 1 winner, and 94 percent of days when there were 2 winners.

Interestingly, while the within household spillovers seem to have affected work without detectable effects on schooling, the within establishment spillovers seem more salient for schooling with nothing consistent for work. Our guess is that this difference reflects that the spillovers within the family reflect the impact of income. The spillovers within the establishment were to support the schooling of those who do not win the lottery for the stipend treatment and they were done to support the schooling of others. Hence, the within establishment spillovers impacted schooling during the time of support, but they did not impact work after the end of support (unlike the family spillovers where the effects of income are enduring).

## DISCUSSION

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The purpose of the Schooling Incentives Project Evaluation, or SIPE, was to improve our understanding of the importance of schooling costs and available employment opportunities for child labor and schooling decisions among children associated with carpet producing establishments in Nepal. Children 10-16 and associated with carpet sector workers in the Kathmandu Valley were assigned to three study groups using random assignment. Group 1 received monitoring for a 14 month study period, acting as a control group since it received no other support. Group 2 received monitoring and a scholarship reimbursing up to \$55 in schooling costs. We call this the scholarship group. Group 3 received monitoring, the scholarship, and an additional stipend that covered one third of the earnings a child could earn in on the loom and roughly equivalent to what children earn as domestic workers around the Valley. We call this the stipend group although they receive both the stipend and the scholarship.

The Nepal GoodWeave Foundation chose subjects for SIPE. They identified a criterion that they felt predicted whether a child was vulnerable to child labor, and found 660 children meeting that criterion associated with licensee establishments. These 660 children were allocated at random across the three study groups described above. GoodWeave tracked subject school attendance throughout the life of the project. In addition, three surveys were collected by New ERA: one before subjects were allocated to study groups, one in the middle of the project, and one after the conclusion of the project. More than 99 percent of subjects interviewed at the start of the project were re-interviewed at the end of the project.

### 5.1. THE IMPACT OF REIMBURSING SCHOOL COSTS

The comparison of the scholarship group to the control group is informative about the impact of fixed schooling costs on work and schooling decisions in the study population. We refer to costs such as fees, tuition, books, uniforms, etc. as fixed costs, because expenditure on them is necessary for school but costs do not vary if a child attends 4 days a week compared to 5 days a week. The scholarship reduced fixed schooling costs compared to the control group.

The scholarship increased school enrollment, but we did not find an impact on school attendance of this reduction in fixed schooling costs in either the midyear survey or the school attendance records that was large enough to be detectable with our sample size and study design. For boys, it appears that the scholarship primarily substituted for education expenditures that the child's family would have otherwise made. There are new expenditures for girls, but they cannot be mapped to increased attendance or improved test performance. Thus, the data do not suggest that fixed schooling costs were a large barrier to school attendance in this study context.

This finding that fixed schooling costs did not exert a large influence on school attendance is important for GoodWeave Nepal. The core of their schooling support program is to cover the fixed costs of schooling for children it believes are vulnerable to child labor, and the scholarship treatment was designed to work exactly like GoodWeave's Sponsored Education Program. While there will be some children whose schooling decision is influenced by fixed costs, we did not observe this to be an important determinant of schooling on average in the population GoodWeave selected subjects for this study. The implication of our findings is that GoodWeave might affect greater returns to scholarship expenditures by carefully targeting who receives support under the Sponsored Education Program. Our findings do not generalize to other contexts or populations outside of the criterion GoodWeave used to select study subjects for this study. Hence, our findings might not extend to the pool of Sponsored Education recipients if GoodWeave uses a different criterion to select individuals for that program. Obviously, schooling support is only one component of what GoodWeave does. This research does not assess the GoodWeave initiative as a whole, which includes several other integrated programmatic components, including inspection, monitoring and certification; child rescue, rehabilitation and long-term educational support; and other preventative programs, such as the provision of day care for the children of adult carpet weavers.

There is some suggestive evidence in SIPE about whose schooling might most be affected by fixed schooling costs. By the time of the yearend survey, support has ended. We find that the scholarship group was less likely to say that it would reenroll in the next school year compared to the control group. The magnitude of the decline in reenrollment for the scholarship group was 4 percent. It was similar to parental reports of declines in school attendance at the very end of the school year. The scholarship group was more likely to be involved in pre-weaving activities such carding, washing, balling, and spinning wool. It is surprising that their schooling may have been lower and pre-weaving work greater than the control group. The most obvious explanation for this is that families responded to increases in the cost of school differently than they would respond to either price decreases or price levels. The scholarship group experienced increases in the cost of school when the program ends. Costs increased to the level paid by the control group, but there was no increase for the control group (who were already paying the higher price). Our findings are consistent with a model where schooling price increases caused children to drop out of school. This implies targeting support at children most likely to experience price increases, perhaps because of their advancement between schooling levels. Of course, testing this hypothesis formally with an experimental design would be necessary before affecting a change in policy.

It is easy to make too much of these potential declines in education among the scholarship group as the data did not present a consistent story, and we are relying mostly on statements by a child of what they would do for schooling in the coming year. Nevertheless, it is useful to consider why families might respond more to price increases than price levels. It could be that poor

families base their understanding of what they can afford on what they currently afford. When the price of one good goes up, they feel they cannot afford it anymore and cut back their consumption of that good, even though they could afford it and would choose to consume it if they had started from the higher price.

This finding that the end of support was associated with potential declines in schooling and increases some types of work compared to groups receiving no support at all is of particular relevance for USDOL Education Initiative projects. USDOL support typically follows 3 year funding cycles. If three years of funding induce individuals to acquire three years of education that they otherwise would not have obtained, then it seems of little importance that the schooling might not continue beyond the project. If that time in school also deterred hazardous work, then a limited funding cycle might be even more beneficial. However, if projects choose to support individuals who would otherwise go to school and did not otherwise deter child labor, then the withdrawal of support could lead to less education and potentially more child labor. Why might projects support individuals who would go to school even without the project support? Well intentioned project staff might feel that they would prefer limited resources to flow to those who most want to go to school, who see its value, and who are easiest to persuade to use the money. We have encountered this view in our own interpersonal interactions with project staff on this project that were upset that SIPE resources would flow to families that did not value education. Of course, we do not know whether our findings from a program with one year of support differ from what we would see after three years of support, and we do not have any general theory that would imply that our results extend to other contexts.

There are two other possible explanations for the decline in schooling and increase in work in the scholarship group. First, there appear to have been some spillovers within establishments associated with having additional scholarship winners in the establishment at midyear. Scholarship winners spent more time in collection activity and unpaid household services at midyear than the control group. However, for the control group, having more scholarship winners present in the establishment reduced time in collection activity and reduced participation in collection activity. It is as if there was some redistribution of child time where the scholarship winners picked up some of the collection activities and unpaid household services at midyear for non-winners. While we observed this at midyear, these spillovers do not appear to persist to yearend and thus do not explain the decline in schooling or increases in pre-weaving activity that we observed at yearend.

A second explanation is that the scholarship appeared to reduce child and household migration and this in turn affected the opportunity cost of schooling. The declines in migration associated with the scholarship were substantive. The scholarship reduced the probability that a child lived somewhere different at yearend by 21 percent. It could be that when children move, it takes time to learn about the employment opportunities open to them. Movers were also more likely to exit carpet establishments than those who did not move (given that they started in carpet

establishments). Hence, movers in the control group could face weaker employment options, making schooling less costly. We do not think the moving explanation is the cause of the scholarship group's greater work and reduced schooling, because stipend subjects experienced a similar reduction in migration as the scholarship group, but they continued their schooling and did not increase their work after the project ended. We think the family's reaction to the increase in school cost is the simplest explanation for why there might have been a decline in schooling and increase in some types of work among the scholarship group. We presume that we did not see a similar response to increases in school costs in the stipend group, because they used saved stipend income to pay school costs. This interpretation is complicated by the fact that we did not actually observe any saving of the stipend.

It is also important to note that the increase in pre-weaving activities observed at yearend in girls was almost matched by a decline in weaving activities. The data did not reject the hypothesis that the scholarship had no impact on weaving, but the estimated effects of the scholarship on weaving were consistent with the view that the scholarship moved some children from weaving to pre-weaving activities. The data were also consistent with the view that girls moved out of unpaid household services and into pre-weaving work as a result of the end of the scholarship. It is just not clear how to think of the rise in pre-weaving work.

Overall, the findings for the impact of the scholarship treatment raised more questions than they answer. The effects of the scholarship were not large in this context. A natural question is how to better identify populations likely to benefit from scholarship support. The termination of support may distort subsequent schooling because of how households respond to losing benefits or increases in the price of schooling. Families may increase some types of work in the undesirable sectors. This suggests more work should be done on the nature of household responses to changes in school prices, but the impact of school price assistance is not as obvious as would be assumed typically.

## **5.2. THE IMPACT OF INCOME SUPPORT**

Overall, the stipend seems to have had a large impact on schooling during the year of support as well as subsequent work when compared to either the scholarship or the control group. Girls were especially influenced by the stipend.

It is important to be clear about what the stipend part of the program actually did. It both provided families who sent their children to school with additional income and it changed the relative price of attending school compared to work or anything else. If a family had a child work or vacation for a school week, the family gave up NPR 1000 in the next month, roughly \$14. The study was not designed to separately identify whether our findings on the impact of the stipend stemmed from the income support or the change in the opportunity cost of alternatives to school. However, the yearend data was collected after the last distribution, so families had received the

income but no longer faced the conditionality that they faced at midyear. Thus, it is possible that the difference between the yearend responses and the midyear responses are informative about the role of income versus the change in the opportunity cost of alternatives to school. However, at yearend, choices were affected by the combined impact of everything that happened during the year of support. It would be impossible to conclusively differentiate the impact of higher income from other persistent impacts of stipend support for a year.

Compared to the scholarship treatment, the impact of the stipend on schooling increased at the end of the year compared to the start. In the first month of the year, the stipend had no impact on schooling compared to the scholarship group or the control group. Attendance rates increased by 11 percent at midyear with the stipend compared to the control group. For the year overall, the attendance rate of the stipend group was 12 percent higher and the stipend group was 62 percent less likely to miss a full calendar month of school than the control group. An important indicator of schooling completion is sitting for the yearend exams. The stipend group was 6 percent more likely to sit for the yearend exam, and they scored 9 percent higher. At yearend, the stipend group was more likely to intend to continue schooling into the next year when compared to the scholarship group, although the stipend group was not more likely to intend to continue schooling than the control group.

The stipend seemed to have little impact on work in the midyear data when compared to the control group. For most types of work, the stipend group seemed to work slightly less than the control population, but the diminished work effect of the stipend was always small in magnitude and never statistically significant. The midyear patterns of elevated collection and time in unpaid household services seen in the scholarship group were not present in the stipend group.

At yearend, the stipend group behaved like the control group in terms of schooling and work except for diminished involvement in weaving activities. The stipend group experienced declines in weaving at yearend that were twice that of the scholarship group. The decline in weaving was especially large for girls. Participation in weaving at yearend was diminished by 68 percent for the female stipend group compared to the scholarship or control group. Given that we saw this decline in weaving at yearend, we cannot identify whether the decline in weaving came from the impact of higher family income or better school achievement during the supported year.

There was some evidence to suggest that our study understated the impact of the stipend on work and schooling during the period of support, because there were spillovers in both the household and the establishment from having more stipend children present. Having more stipend children in either the household or the establishment reduced the economic activity and increased school test scores for non-stipend children at midyear and in the school attendance records. We did not see any evidence that spillovers attenuated the observed effects of the scholarship program. Attenuation only appeared possible with the stipend, and it only seemed to occur during the period of stipend payout. At yearend, after treatment ended, we did not find evidence of

spillovers from stipend recipients to non-recipients. Thus, while our evidence on the impact of the stipend on school attendance may be biased downward, we do not believe there is any such bias in the weaving findings.

The spillover results are potentially useful in disentangling whether the decline in weaving comes from the stipend income or the improvement in school performance. We found evidence of stipend spillovers on school performance, but we found no spillovers in weaving engagement. This would seem to suggest that the decline in weaving came more from the higher income attributable to the stipend rather than the improved school performance (where there are spillovers), but we do not feel the argument can be made conclusively.

Our finding of the importance of the stipend, perhaps through its increase in income, for discouraging weaving among girls, has broader policy implications. It highlights that reducing the costs of education alone may not deter child engagement in export-oriented jobs. Rather, there seems to be considerable wisdom in current efforts to embed child labor policy in a context of livelihood promotion. Punitive steps such as trade sanctions that punish sectors where children work may lower income and increase child labor.

### **5.3. NEXT STEPS**

These findings raise several additional questions for the design of efforts to deter child labor in the carpet sector of Nepal and for USDOL's efforts to combat child labor worldwide. We begin with the carpet sector of Nepal and move to the broader questions. It is critical to emphasize first that the findings of this study do not say anything about the impact of long-term education support and do not necessarily generalize to other contexts beyond the study subject chosen for SIPE. The remainder of this section is entirely speculative.

Can scholarship support be more effectively targeted? This study was conducted on a population that GoodWeave Nepal identified as vulnerable to child labor. We were not able to detect a positive effect on schooling from paying schooling costs. This might have occurred because many recipients did not need the scholarship support while it was critically important for a few. We think that our findings are consistent with the idea that those experiencing an increase in schooling costs perhaps because of school transitions might benefit the most from support. More work should be done to identify an appropriate targeting formula for schooling support.

Can scholarship support be self-financing? A chronic problem among employers in the carpet sector of Nepal is worker turnover. We found reduced movement of children and their families with participation in the scholarship program as well as the stipend program. We do not know how large the benefits to employers might be of retaining workers, but the scholarships were small compared to the market value of carpets produced. Could it be profitable for employers to support benefits such as this in order to retain labor? Would the impact of scholarships on worker

retention differ from simply paying the scholarship amount to workers as higher wages? We do not know the answer to these questions, but additional research in this area seems promising provided it is coupled with research that will improve the efficacy of scholarship spending.

How much income support is necessary to delay child entry into weaving? The stipend seemed to deter the involvement of girls in weaving even after the conditions for the stipend expired. GoodWeave Inspectors based on qualitative interviews chose the amount of the stipend, but there must be some elasticity. Could the same changes have been affected by smaller stipends? Given that we saw declines in adult labor supply and adult labor income that did not appear to be explainable by additional adult time supporting their students, there may be scope for similar changes with a reduced stipend. If there were to be a scaling up of a program like the stipend, it is obvious that more would need to be done to get the benefit level right. This seems like a natural priority given that only the combined scholarship - stipend treatment seemed to have a lasting impact on the involvement of girls in weaving. Would other livelihood promotion alternatives that raise household income have the same impact? We do not know.

How important is conditionality in the response to the stipend? The stipend not only provided economic support, but it did so while changing the cost of missing school. This may be very important to the stipend's impact. Structural estimates from Mexico's Oportunidades program imply that the conditionality of that transfer is responsible for that program's impact on schooling (Todd and Wolpin 2006). Baird et al (2011) implemented a randomized control trial in Malawi where they explicitly compared a conditional to an unconditional cash transfer and they found that the conditionality more than doubled the transfer's impact on school enrollment. Enforcing conditionality is expensive in that it requires school visits, may induce children to attend school who are too sick to go, and creates tension between the aid provider and the recipients. It seems important to understand its importance in this context.

It is also important to remember that while the stipend's impact on schooling attendance and carpet weaving was larger than the scholarship's, the stipend treatment (which includes both the stipend and the scholarship) was more expensive. A scholarship recipient received NPR 3950 per year. A stipend recipient received both the scholarship and as much as an additional NPR 12,000 per year. Thus, the total cost of the stipend treatment was up to NPR 15950 in direct costs without considering the additional monitoring and distribution costs required for the stipend. There were few instances where the impact of the stipend was three times that of the scholarship. One way to gauge the impact of the two interventions is to transform estimated treatment effects into average cost per treatment effect by dividing the total cost of a treatment by the estimated treatment effect. For example, the average cost of increasing school attendance rates with the scholarship was NPR 1,039 per percentage point (table 3 results). The average cost of increasing school attendance rates with the stipend treatment was NPR 1,611. For girls, the stipend costs NPR 1,477 per point increase in attendance rates, and the scholarship costs NPR 1,129. For younger children, the scholarship costs NPR 608 per point increase in



attendance rates and the scholarship costs NPR 1,579. For girls, the stipend costs NPR 2,312 per percentage point decline in the prevalence of weaving and the scholarship costs NPR 1,646. For older children, the stipend costs NPR 2,279 per percentage point decline in weaving participation compared to NPR 878 for the scholarship. Hence, while the stipend had generally significant effects and the scholarship did not, the estimated magnitudes did not imply in general that stipend was the most cost effective way to promote schooling and deter weaving. The most important exception to this result is that the stipend is more cost effective at keeping girls living with at least one parent. It costs NPR 3,067 to reduce the probability that a girl lives without a parent by one percentage point with the stipend treatment and NPR 5,643 with the scholarship. More research, and especially research on a larger scale, is required to understand how to most cost-effectively encourage schooling and discourage child labor.

How prevalent were negative effects of the end of education support and what could be done to mitigate them? There are intrinsic concerns associated with programs that provide support about whether they foster dependency or discourage parents from taking responsibility for educating their children. In the present case, subjects knew that program benefits would last only one year. Despite this, we see hints of a decline in schooling and increase in some types of work for the scholarship group. This study did not anticipate this finding and cannot conclusively say what is behind it. We think the best explanation is that the end of the scholarship felt like an increase in school costs that the scholarship families could not afford. This phenomena of benefits ending is common to most donor funded initiatives, and it seems important to develop an understanding of how widespread this is, why it occurs, and what might be done to prevent it.

Are there benefits to education support in vulnerable populations that extend beyond education and child labor? Migrant children and children living independently are typically some of the most vulnerable in society. In this study, we found an impact of the stipend and scholarship combination on whether children resided with a parent. 7.7 percent of children in the control group lived without any parent present after the conclusion of support whereas 3.7 percent of children receiving the scholarship and stipend together lived without any parents, a 52 percent reduction. The impact of the stipend and scholarship combination was especially large for girls: it reduced the probability a girl lived without any parent present by 63 percent. Such a large impact of the stipend on the presence of a parent was not anticipated, but it points to the possibility of school-based interventions reducing child vulnerability before vulnerability arises. Effective levers to reach the most vulnerable are difficult to find, and these unexpected findings point to the utility of further research into how to use schools and school based interventions to deter child migration and the departure of parents.

## BIBLIOGRAPHY

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- Angelucci, M. and De Giorgi, G. (2009). Indirect Effects of an Aid Program: How Do Cash Transfers Affect Ineligibles' Consumption. *American Economic Review* 99(1), 486-508.
- Angelucci, M., De Giorgi, G., Rangel, M., and Rasul, I. (2011). Family Networks and School Enrolment: Evidence From A Randomized Social Experiment. *Journal of Public Economics*, Forthcoming.
- Anderson, M. (2008). Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects. *Journal of The American Statistical Association* 103(484), 1481-1495.
- Attanasio, O., Fitzsimons, E., Gomez, A., Gutierrez, M.I., Meghir, C., and Mesnard, A. (2010). Children's Schooling and Work in the Presence of a Conditional Cash Transfer Program in Rural Colombia. *Economic Development and Cultural Change*, 58 (2):181-210.
- Biard, S., McIntosh, C., and Ozler, B. (2011). Cash Or Condition? Evidence From A Cash Transfer Experiment. *Quarterly Journal Of Economics*, Forthcoming.
- Edmonds, E. (2006). Child Labor and Schooling Responses to Anticipated Income in South Africa. *Journal of Development Economics*, 81(2): 386-414.
- Edmonds, E. and Shrestha, M. (2010). *The Schooling Incentives Project Evaluation: Analysis Plan*. Hanover Nh: International Child Action Research And Evaluation, Llc.
- Edmonds, E. and Schady, N. (2012). Poverty Alleviation And Child Labor. *American Economic Journal: Economic Policy*, Forthcoming.
- Fiszbein, A. and Schady, N. (2009). *Conditional Cash Transfers: Reducing Present and Future Poverty*. World Bank, Washington, D.C.
- Schultz, T. P (2004). School Subsidies for the Poor: Evaluating The Mexican Progresa Poverty Program. *Journal Of Development Economics*, 74(1): 199-250.
- Skoufias, E., and Parker, S.W. (2001). Conditional Cash Transfers and their Impact on Child Work and Schooling: Evidence from Mexico. *Economia*, 2 (1): 45-86.

Todd, P. and Wolpin, K. (2006). Assessing the Impact of a School Subsidy Program in Mexico: Using a Social Experiment to Validate a Dynamic Behavioral Model of Child Schooling and Fertility. *American Economic Review* 96, 1384-1417.